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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/967,309 | 09/28/2001 | Kiyoshi Yamaura | 112857-290 | 5201 |

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| EXAMINER | |
|---|---|
| BELL, BRUCE F | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1746 | |

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/967,309 | YAMAURA ET AL. | |
| | Examiner | Art Unit | |
| | Bruce F. Bell | 1746 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 12-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 36-40 is/are allowed.

6)☒ Claim(s) 12-35 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 September 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 12, 14, 15, 18-22, 25-29, 32-35 rejected under 35 U.S.C. 102(e) as being anticipated by Hinokuma et al (6495290).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The prior art of Hinokuma et al discloses a fuel cell device having a proton conductor containing a carbonaceous material such as fullerene, carbon clusters, tubular carbonaceous material which groups are capable of transferring protons such as -OH groups or -$OSO_3H$ groups introduced into the carbon atoms of the carbonaceous material. See abstract and col.3, lines 4-8. The fuel cell is disclosed to employ a proton conductor having a wide variety of carbonaceous materials. See col. 2, lines 40-46. The

proton conductor is mainly formed of a carbonaceous material in tubular form which tubular carbonaceous materials include carbon nano-tube (CNT) material, single wall carbon nano-tube (SWCNT), multiple wall carbon nano-tube (MWCNT), carbon nano-fiber (CNF) material. See col. 5, lines 60-65. The fuel cell is shown to have a catalyst on the fuel electrode and the oxygen electrode. See col. 10, lines 56-58. The thickness of the proton conductor material is shown to be 300 μm or less. See col. 11, lines 40-41 and 63-65. The positive electrode is shown in the fuel cell assembly to be made by a coating a paste of platinum supported by a powder of carbon. Col. 12, lines 32-45.

The prior art of Hinokuma et al anticipates the applicant's instant invention as set forth above.

***Claim Rejections - 35 USC § 103***

3. Claims 13, 16, 17, 23, 24, 30, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinokuma et al (6495290) in combination with Wilkinson et al (6613464).

Hinokuma et al is as set forth above with respect to the 35 USC 102 rejection.

Hinokuma et al does not teach the gas diffusion electrode thickness of 10 μm or less or the catalyst having a metal component.

Wilkinson et al disclose that in fuel cell electrode applications that it is know to use platinum as a catalyst in finely comminuted form as is deposited on to an electrode substrate of a carbon fiber paper. See col. 1, lines 38-46.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though

Hinokuma et al does not teach the catalyst being metal in form, Wilkinson teaches that it is conventional in the art to use metal catalyst in fine form on carbon fiber materials. Therefore to it would have been obvious to one having ordinary skill in the art to have replaced the catalyst material not specified, in the Hinokuma et al patent with a catalyst material containing metal with carbon for the purpose of generating reaction at the electrode surface to transport ions through the electrolyte to the opposite electrode in the fuel cell to produce energy. The thickness of the electrode is within the ability of the person having ordinary skill in the art to optimize the performance of the cell and to also aid in making the fuel cell and small as possible.

***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 12, 16, 17, 19, 20, 23, 24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of

U.S. Patent No. 6726963. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant invention are encompassed by those of the patented claims. Even though the patented claims are directed to a method of forming at least one of a fuel and oxygen electrode, the patented claims teach carbon bases electrodes producing a carbonaceous material which will be deposited onto the proton conductor (claim 1) and a proton conductor material having a carbonaceous material composed of a carbon defining a matrix into which one or more proton dissociating groups are introduced (claim 4). Further claim 2 of the patent discloses the catalyst of a metal being incorporated into the carbonaceous material used to form the fuel and oxygen electrodes and more specifically claim 3 states the metal component be of platinum, platinum alloys or combinations thereof. Even though the claims in the patent, are drawn to a method, instead of to an apparatus, the same subject matter is found in both the application claims and the patented claims and therefore, an obvious double patenting is proper.

***Allowable Subject Matter***

6. Claims 36-40 are allowable over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach and/or suggest the method of producing the fuel cell in which a carbonaceous material is mixed with a solvent having a proton conductive material and coating the surface of the carbonaceous material with the

proton conductor material and then forming at least one of the fuel or oxygen electrodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BFB
May 3, 2004

Bruce F. Bell
Primary Examiner
Art Unit 1746